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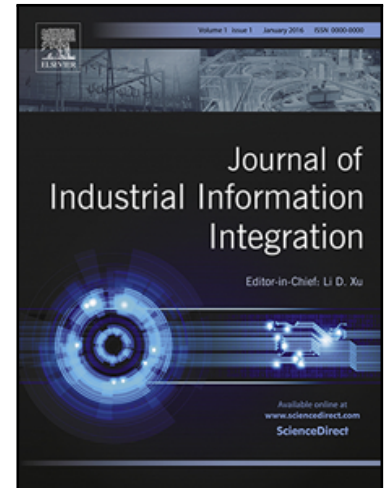
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Industrial IoT in 5G Environment towards Smart Manufacturing

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Abstract: Smart manufacturing based on cyber-physical manufacturing systems (CPMS) has become the development trend and been widely recognized all over the world. Throughout the development trend of CPMS, one of the key issues is industrial Internet-of-Things (IIoT) with the characteristics of automation, smart connected, real-time monitoring, and collaborative control. Along with the permeation and applications of advanced technologies in manufacturing, massive amounts of data have been generated in the manufacturing process. However, the current 3rd generation mobile network (3G), 4G and other communication technologies cannot meet the demands of CPMS for high data rate, high reliability, high coverage, low latency, etc., which hinders the development and implementation of CPMS. As a future advanced wireless transmission technology, 5G has a significant potential to promote IIoT and CPMS. Based on the architecture and characteristics of 5G wireless communication technology, this paper proposes the architecture of 5G-based IIoT, and describes the implementation methods of different advanced manufacturing scenarios and manufacturing technologies under the circumstance of three typical application modes of 5G, respectively, i.e., enhance mobile broadband (eMBB), massive machine type communication (mMTC), ultra-reliable and low latency communication (URLLC). Besides, the characteristics, key technologies and challenges of the 5G based IIoT are also analyzed.

Key Words: 5G, Industrial Internet-of-Things (IIoT), Cyber-physical Manufacturing System (CPMS), smart manufacturing, architecture

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